CLAIMS

1. Breathing assistance device comprising :
- a turbine to generate a flow of pressurised respiratory gas,
- a duct to carry the pressurised gas to a patient,
- control means for controlling gas pressure capable of elaborating a pressure setting for the turbine, characterised in that the turbine is associated to a speed sensor capable of acquiring a signal corresponding to the rotation speed of a rotating element of the turbine, and the control means include means of calculation connected to said speed sensor to elaborate from said signal a pressure setting and send said pressure setting to the turbine.

2. Device as claimed in the preceding claim, characterised in that said speed sensor implements a Hall effect sensor.

3. Device as claimed in claim 1, characterised in that said speed sensor is a sensor capable of acquiring a turbine speed signal directly linked to the rotation speed of a rotating element of the turbine.

4. Device as claimed in one of the preceding claims, characterised in that the means of calculation elaborate the pressure setting according to variations in speed.

5. Device as claimed in one of the preceding claims, characterised in that said means of calculation are capable of detecting new inspiratory or expiratory cycles, and consequently adapting the level of the pressure setting.

6. Device as claimed in the preceding claim, characterised in that said means of calculation are associated to a program for detecting inspiratory cycle using a comparison between :

- A memorised speed value value extrapolated using recent values of measured speeds, and
- An instantaneous speed actually measured.

7. Device as claimed in one of the two preceding claims, characterised in that said means of calculation are associated to a program for detecting inspiratory cycle using a comparison between :

- A memorised speed value as representative of a recent speed bearing, and
- An instantaneous speed actually measured.

8. Device as claimed in one of the three preceding claims, characterised in that said means of calculation are associated to a program for detecting inspiratory cycle using a comparison between:

- A memorised speed value as representative of a speed at the end of the expiratory cycle, and
- An instantaneous speed actually measured.

9. Device as claimed in one of the three preceding claims, characterised in that said means of calculation are associated to several programs for detecting inspiratory cycle operating simultaneously, and are capable of elaborating a pressure setting corresponding to a start of inspiratory cycle as soon as one of said programs for detecting inspiratory cycle has signalled a start of inspiration.

10. Device as claimed in one of the four preceding claims, characterised in that the program(s) for detecting inspiratory cycle is (are) associated to disabling means for a determined duration following the start of a new expiratory cycle.

11. Device as claimed in one of the five preceding claims, characterised in that the means of calculation are associated to a program for detecting expiratory cycle.

12. Device as claimed in the preceding claim, characterised in that said program for detecting expiratory cycle uses a comparison between:

- A memorised maximum turbine speed, corresponding to an inspiratory cycle, and
- An instantaneous speed actually measured.

13. Device as claimed in one of the preceding claims, characterised in that said means of calculation include a microprocessor connected to the speed sensor and to a turbine pressure setting input.

14. Device as claimed in one of the preceding claims, characterised in that the device also includes a pressure-regulating loop comprising :

- a pressure sensor on the duct, and
- a circuit receiving the pressure setting coming from the means of calculation as well as the pressure measured by the pressure sensor, said circuit being capable of elaborating an instantaneous rotation speed setting for the turbine, said circuit being connected to a turbine speed setting input.

15. Method for regulating the pressure of a respiratory gas delivered by a turbine to a patient, the method comprising elaborating a pressure setting for the turbine, characterised in that said pressure setting is elaborated using a signal representative of the rotation speed of a rotating element of the turbine.

16. Method as claimed in the preceding claim, characterised in that said signal corresponds to the rotation speed of the turbine rotor.

17. Method as claimed in one of the two preceding claims, characterised in that the method is capable of detecting new inspiratory or expiratory cycles, and of consequently adapting the level of the pressure setting.

18. Method as claimed in the preceding claim, characterised in that the method implements a program for detecting inspiratory cycle using a comparison between:

- A memorised speed value that was extrapolated from recent values of measured speeds, and
- An instantaneous speed actually measured.

19. Method as claimed in one of the two preceding claims, characterised in that the method implements a program for detecting inspiratory cycle using a comparison between:

- A memorised speed value as representative of a recent speed bearing, and
- An instantaneous speed actually measured.

20. Method as claimed in one of the three preceding claims, characterised in that the method implements a program for detecting inspiratory cycles using a comparison between:

- A memorised speed value as representative of a speed at the end of an expiratory cycle, and
- An instantaneous speed actually measured.

21. Method as claimed in one of the three preceding claims, characterised in that the method implements several programs for detecting inspiratory cycles operating simultaneously, and elaborates a pressure setting corresponding to an inspiratory flow as soon as one of said programs for detecting inspiratory cycles has signalled the start of inspiration.

22. Method as claimed in one of the four preceding claims, characterised in that the program(s) for detecting inspiratory cycles is (are) associated to disabling means during a determined duration following the start of a new expiratory cycle.

23. Method as claimed in one of the six preceding claims, characterised in that the method implements a program for detecting expiratory cycles.

24. Method as claimed in the preceding claim, characterised in that said program for detecting expiratory cycle uses a comparison between:

- A memorised maximum turbine speed, corresponding to an inspiratory cycle, and
- An instantaneous speed actually measured.